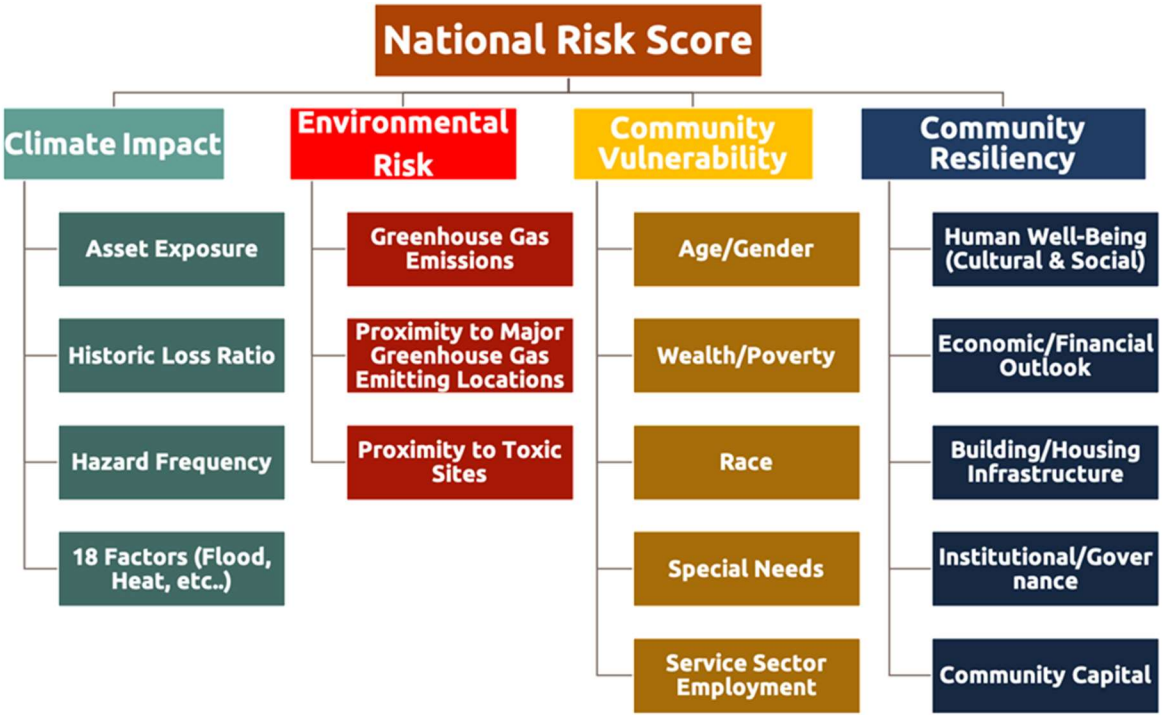
Introduction to the SRS Spatial Risk Scores

Spatial Risk Systems introduces the SRS Spatial Risk Scores, designed to measure risk at the location level. The SRS Risk Scores are calculated at the census tract, county, and postal code levels, or on a user-defined geographic area.

Spatial Risk Scores measure the exposure to location-specific factors that have a long-term effect on asset value, environmental impact, operational effectiveness, and social sustainability.

The SRS Spatial Scores are relative measures. They are designed to compare risk across different locations and expose the driving factors of risk in each location.



The SRS Risk Score further predicts the toll the event will have on a location by focusing on the extreme yet predictable effects of climate disasters. Will the population and the assets recover after the initial event, or will demographic and socioeconomic factors force a permanent change? We are assuming an asset that takes 10 or more years to recover is permanently altered. The scores are also a leading indicator of what might be expected from an environmental disaster.

Using a methodology similar to the one described in the National Risk Index Primer, SRS quantifies risk to determine likely outcomes when a catastrophic event occurs, but with a few fundamental changes[1]. The Risk Scores are divided into ten risk bands where SP1 is the least risky and SP10 the most severe.

[1] See Spatial Risk Score Methodology

The Scores communicate the long-term risk posed to an asset if demographics, environmental, and social risk factors are not addressed.

SRS Spatial Risk Score	Description
SP1	Extremely Favorable
SP2	Very Favorable
SP3	Favorable
SP4	Satisfactory
SP5	Challenging
SP6	High Challenges
SP7	Extreme Challenges
SP8	Vulnerable
SP9	Very Vulnerable
SP10	Extremely Vulnerable

Underlying the primary SRS Risk Score are component scores that serve to magnify or mitigate the cost, toll, and duration of an event and affect the overall risk to a community or asset.

For example, if the SRS Community Vulnerability of an asset's location is 6 (High Challenges), or higher, the area is more likely to have a difficult time recovering from climate or environmental-related events. Should the inverse be true, and the SRS Resilience score is on the satisfactory to favorable end of the scale, the asset will be more likely to overcome the adverse effects of climate and environmental-related disasters.

Magnifiers & Mitigators	Description
Climate Impact Score	Represents the overall risk from all possible types of natural disasters
Community Vulnerability Score	Demographic characteristics that might increase the negative impacts of a natural hazard
Community Resilience Score	Demographic characteristics that might reduce the negative impacts of a natural hazard
Environment Risk Score	Measures risk from exposure to harmful environmental factors

Climate Risks

Avalanche	**Landslide**
Coastal Flooding	**Lightning**
Cold Wave	**Riverine Flooding**
Drought	**Strong Wind**
Earthquake	**Tornado**
Hail	**Tidal Wave**
Heat Wave	**Volcanic Activity**
Hurricane	**Wildfire**
Ice Storm	**Winter Weather**

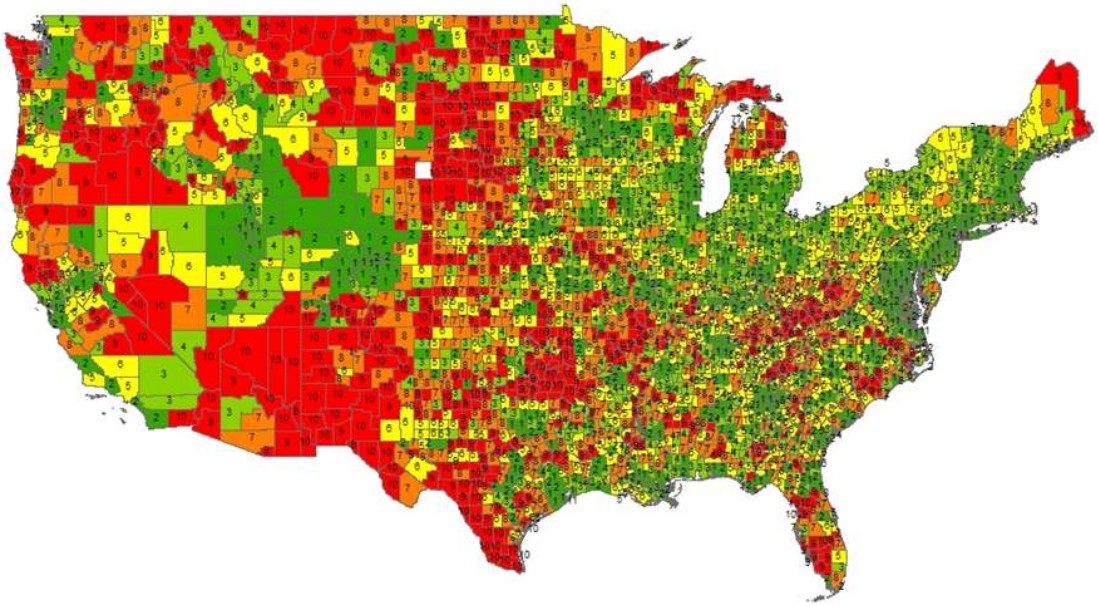
If an asset is in a high-risk location, mitigation plans should be put in place to limit the financial loss to that asset, should the event occur.

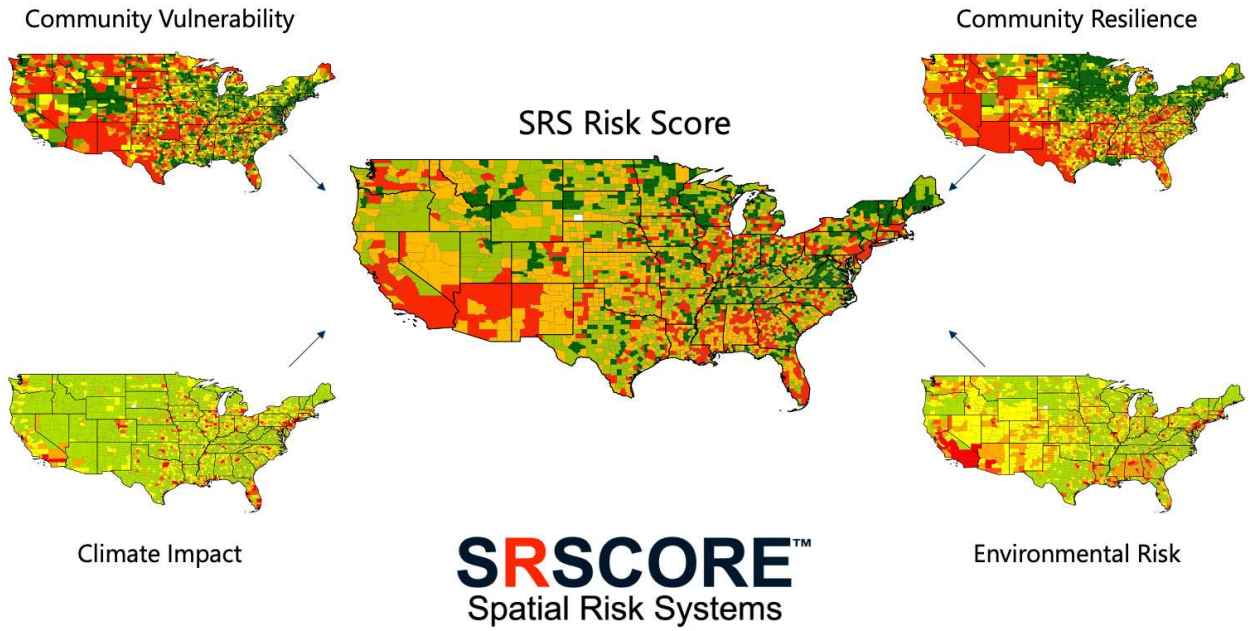
Community Vulnerability Score	Description
CVUL _SP1	Extremely Favorable
CVUL _SP2	Very Favorable
CVUL _SP3	Favorable
CVUL _SP4	Satisfactory
CVUL _SP5	Challenging
CVUL _SP6	High Challenges
CVUL _SP7	Extreme Challenges
CVUL _SP8	Vulnerable
CVUL _SP9	Very Vulnerable
CVUL _SP10	Extremely Vulnerable

Community Resilience score	Description
CRES **_SP1**	Extremely Favorable
CRES **_SP2**	Very Favorable
CRES **_SP3**	Favorable
CRES **_SP4**	Satisfactory
CRES **_SP5**	Challenging
CRES **_SP6**	High Challenges
CRES **_SP7**	Extreme Challenges
CRES **_SP8**	Vulnerable
CRES **_SP9**	Very Vulnerable
CRES **_SP10**	Extremely Vulnerable

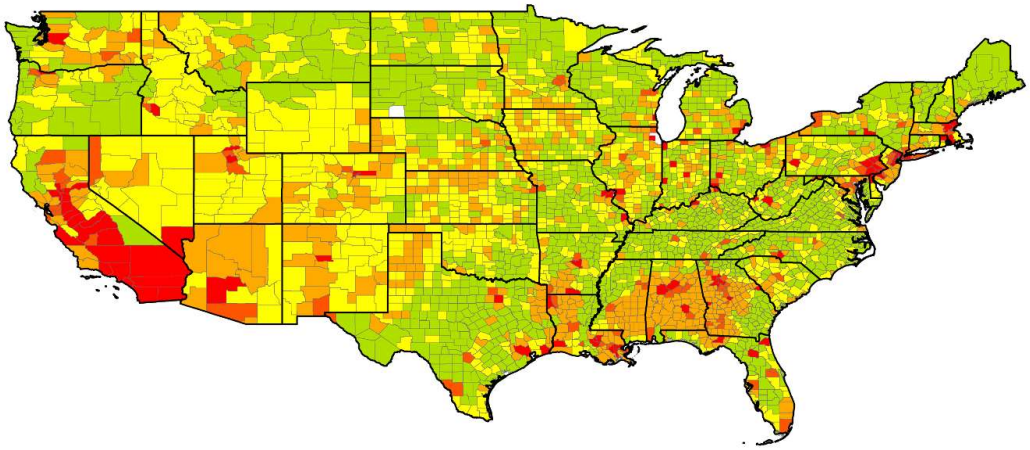
Environmental, climate/weather impact factors intensify the existing socio-economic conditions leading to a higher risk for both population and assets.

SRS Risk Score by County



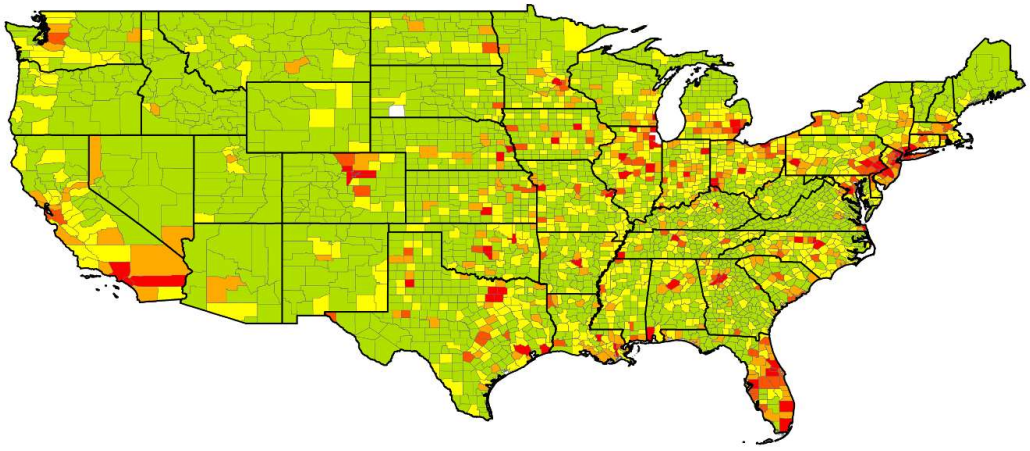


SRS Environmental Risk Score

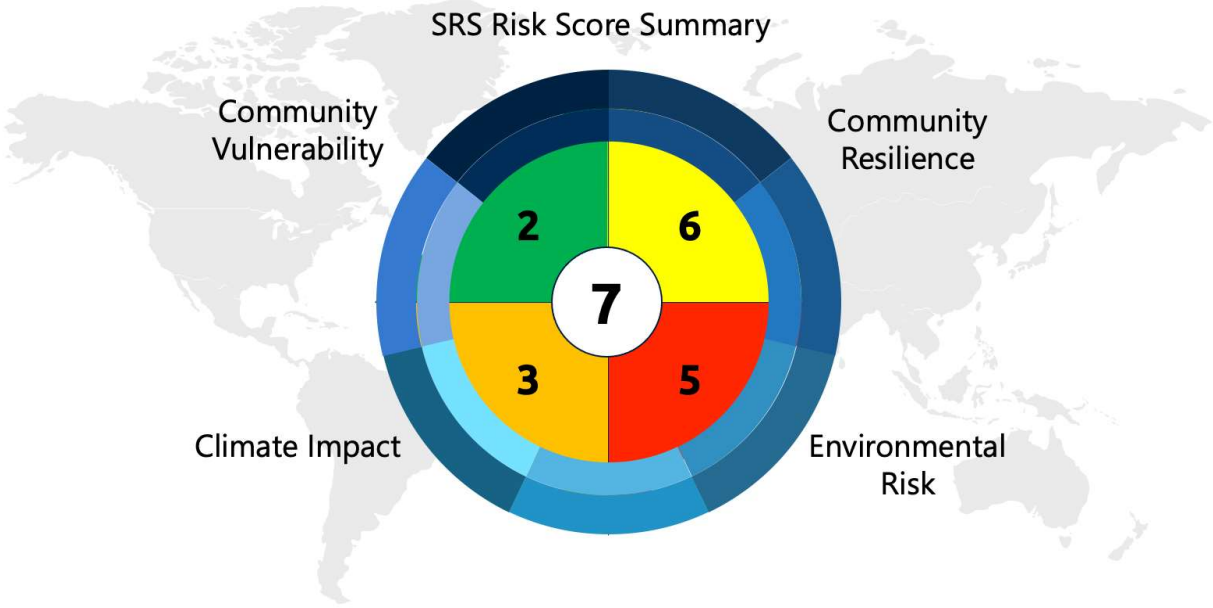


- Environmental Impact
  - Lead Paint
  - Diesel Parfticulate
  - Air Toxins Cancer
  - Respiratory Hazard
  - Traffic and Volume
  - Water Pollution
  - Proximity to NPL List
  - Proximity to RPL

SRS Climate Impact Score



- Climate Weather Loss
  - Asset Exposure
  - Historic Loss Ratio
  - Hazard Frequency
  - 18 Factors (Flood, Heat, etc.)



Each SRS Risk Score carries with it the interaction of location, climate, environmental, demographics, vulnerability, and resilience to better understand the risk to assets and population. Local environmental conditions such as air quality, proximity to dangerous, unsafe, and toxic release sites are distributed unevenly across the States. Understanding the interplay of these factors brings us to the root of Spatial Risk.

Investors, risk managers, and municipalities need to understand where their assets and communities fall on this spectrum. Are they located in areas where magnifiers or mitigators of risk exist?

The SRS Risk Scores enable us to understand, in advance, the unique mix of risk magnifiers and mitigators, which can so profoundly affect an outcome when the area comes under pressure.

Our review of natural disasters and their outcome has shown that while the risk factors were often identified, they were not quantified to measure the overall spatial risk. The SRS Risk Scores are designed to start that conversation.

About Spatial Risk Systems (SRS): Founded by data science leaders from the financial sector, SRS quantifies risk by unifying, standardizing, and analyzing empirical data sources, helping investors to better understand ESG and sustainable investing outcomes, from a facility to a large-scale geographic perspective.

SRS has engineered a massive spatial-level knowledge graph, unifying hundreds of open and proprietary-source data sets, under a single set of enterprise standards. This spatial graph exposes thousands of potential factors that can be incorporated in quantifying spatial-related risks.

- 3.5 million Asset Locations
- 19 million Open Data Set Mapping Relationships
- 966 million Asset Location Relationships

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